Nearly 150 people representing 33 universities and seven countries attended Idaho National Laboratory's second annual Advanced Test Reactor National Scientific User Facility (ATR NSUF) Users Week recently in Idaho Falls.

Second annual Users Week introduces next generation of nuclear scientists to INL

By Julie Ulrich, *INL Communications & Governmental Affairs*

The rainy Seattle-like weather didn't keep the almost 150 participants away from Idaho National Laboratory's second annual Advanced Test Reactor National Scientific User Facility (ATR NSUF) Users Week, held June 7-11 at University Place in Idaho Falls.

The week-long INL-sponsored event brought together students, faculty and top industry and national laboratory researchers from seven different countries and 33 universities. Participants got the opportunity to network, share their research, and learn about the latest techniques and capabilities in nuclear science and engineering.

Users Week brings students, faculty and top industry and national laboratory researchers together to learn and collaborate.

The first day of the 2010 Users Week opened with a morning workshop covering the capabilities of INL's ATR NSUF and the irradiation and post-irradiation tools available to users. U.S. Department of Energy (DOE) Assistant Secretary for Nuclear Energy Warren "Pete" Miller greeted attendees Monday morning via a special video welcome. He credited the ATR NSUF as a "vital resource" that helps make irradiation and post-irradiation facilities accessible to the university community and industry and grants users access to some of the "most modern analytical capabilities" in the world.

The clouds cleared Tuesday, and a beautiful sunny day greeted participants attending the first full day of courses. The curriculum for the week included several lectures and presentations, new instrumentation and experimenter hands-on courses, and a research forum showcasing presentations by current users. Throughout the week, users had the opportunity to attend sessions covering a variety of topics, including:

o Advanced Test Reactor and post-irradiation capabilities
o Current and advanced techniques for length detection
o Basics of corrosion and radiation damage
o Light-water reactor materials
o Reactor materials modeling
o Fast-spectrum reactor fuels and materials
o Advanced gas-cooled reactor fuels and materials
o Non-destructive examination
o Experimental design, tools for neutronic analysis, and thermal analysis

Participants network, share their research, and learn about the latest techniques and capabilities in nuclear science and engineering.

In addition to the course curriculum, participants also had the opportunity to tour INL Site facilities to see firsthand what the ATR NSUF has to offer. The tour visited the ATR, Materials and Fuels Complex, Hot Fuel Examination Facility hot cell, Analytical Laboratory and Electron Microscopy Laboratory.

The June 9 users dinner in the Center for Advanced Energy Studies building gallery, gave participants a chance to interact with each other in a more relaxed and unstructured environment.

Dinner speaker Dennis Miotla, Office of Nuclear Energy Deputy Assistant Secretary for Nuclear Facility Operations, welcomed participants to INL and explained why making a long-term investment in the nuclear industry is important to DOE.

"We want to encourage people to become nuclear engineers and scientists and get back to the high numbers of graduates we had in the 1970s," he said. "Without [a new generation of nuclear scientists], there will be no nuclear renaissance in the United States."

Miotla also announced the five new projects — selected from 14 submissions made during the spring solicitation period — awarded use of the ATR NSUF. The following three awarded proposals are irradiation and post-irradiation experiments (PIE):

• Darryl Butt of Boise State University will work with collaborators from Westinghouse and the University of Wisconsin on an experiment entitled, "High Temperature In-Pile Irradiation Test of Single Phase U3Si2." The team will perform high-temperature nuclear fuel testing on uranium silicide (U_3Si_2) which has previously only been tested at temperatures below 200°F; the research will therefore fill a void in the existing fuel data.
• Yongho Sohn of University of Central Florida will work with a team from the Georgia Institute of Technology, INL, Argonne National Laboratory and Ohio State University on a project entitled, "Low Fluence Behavior of Metallic Fuels." The team will analyze new metallic fuels under development and advance understanding and modeling of fuel performance.
• Sean McDeavitt of Texas A&M University will collaborate with several researchers from the Lightbridge Corporation on a proposal titled, "Irradiation Behavior and Performance of a Uranium-Zirconium Metal Alloy Fuel." McDeavitt aims to determine whether metallic fuels being developed for next-generation reactors could also be used in present-day light-water reactor (LWR) cores. The team will compare current oxide fuel to the next-generation fuel, with the aim of improving the latter's performance and reliability.

Users Week participation is growing as word of its opportunities spreads.

The following two awarded proposals are PIE-only projects:
• Emmanuelle Marquis of the University of Michigan will collaborate with TechSource, Inc., and INL on "Radiation-induced Segregation/Depletion at Grain Boundaries in Neutron Irradiated 304SS at Low Dose Rates." The experiment will use post-irradiation equipment to collect more complete data on stainless steels irradiated at low dose rates, develop new methods for grain boundary analysis and allow for materials degradation predictions. It will also analyze the microstructural changes in hex blocks irradiated in INL's EBR-II fast reactor.
• Mitra Taheri of Drexel University in Philadelphia will use the ATR Pre-Irradiated Sample Library for an experiment titled, "Multi-scale Investigation of the Influence of Grain Boundary Character on RIS and Mechanical Behavior in LWR Steel." Taheri will perform a multi-scale analysis on how specific grain boundary character distributions can have a negative effect on mechanical behavior of steel alloys in LWRs.

Miotla went on to explain that he is often asked why national scientific user facilities grant users access to top nuclear facilities at no charge. His answer: to attract the best and brightest of the next generation to the nuclear field. Besides recruiting a future work force, the ATR NSUF also benefits because "students and professors come in and give suggestions on how INL can run the reactor and facilities better. They bring fresh sets of eyes and new ideas."

In addition to taking courses, participants toured INL Site facilities to see firsthand what the ATR NSUF has to offer.

The advantages for students attending Users Week and working with researchers and scientists on experiments through the ATR NSUF are numerous. Dr. Jeff King, the lead for a faculty-student research team from the Colorado School of Mines and the Missouri University of Science and Technology, said two of the research students who worked with him on experiments in the ATR NSUF received job offers at INL immediately thereafter. King remarked that through the ATR NSUF, the students "were able to practice [advanced techniques on state-of-the-art equipment] to gain the experience they needed when they were given real specimens…The big outcome for [the students] was the contacts [they] made working at the ATR NSUF. After working [as researchers] at the User Facility, they came back and were hired."

During the research forum session, current and recent users shared their positive experiences working with the INL ATR NSUF and encouraged participants to take part in the program.

Meimei Li of Argonne National Laboratory explained how she used ATR pre-irradiated sample library archive specimens to complete her research project on irradiated ferritic steel in a very short amount of time. She credited the sample library as a great tool available to users to expedite the research process. Li submitted her research proposal in October 2009. It was approved in November 2009, and the team started research in December 2009.

"It was no miracle [we could complete the research so quickly]," Li said. "It only happened because we got great support from a lot of people at the ATR NSUF, Argonne National Laboratory and Los Alamos National Laboratory. This helped us to [accomplish a lot] in a very short amount of time."

Rick Provencher, manager of the DOE Idaho Operations Office, commented on the growth of Users Week. "Look at attendance this year versus last year – we have more attending and more curriculum. Attendees from last year spread the word about Users Week to colleagues and peers. Help make next year's Users Week an even bigger success by continuing to share what Users Week has to offer."

Feature Archive